

# WP2 PAST PERFORMANCES

**WP 2.1, 2.2 and 2.3**

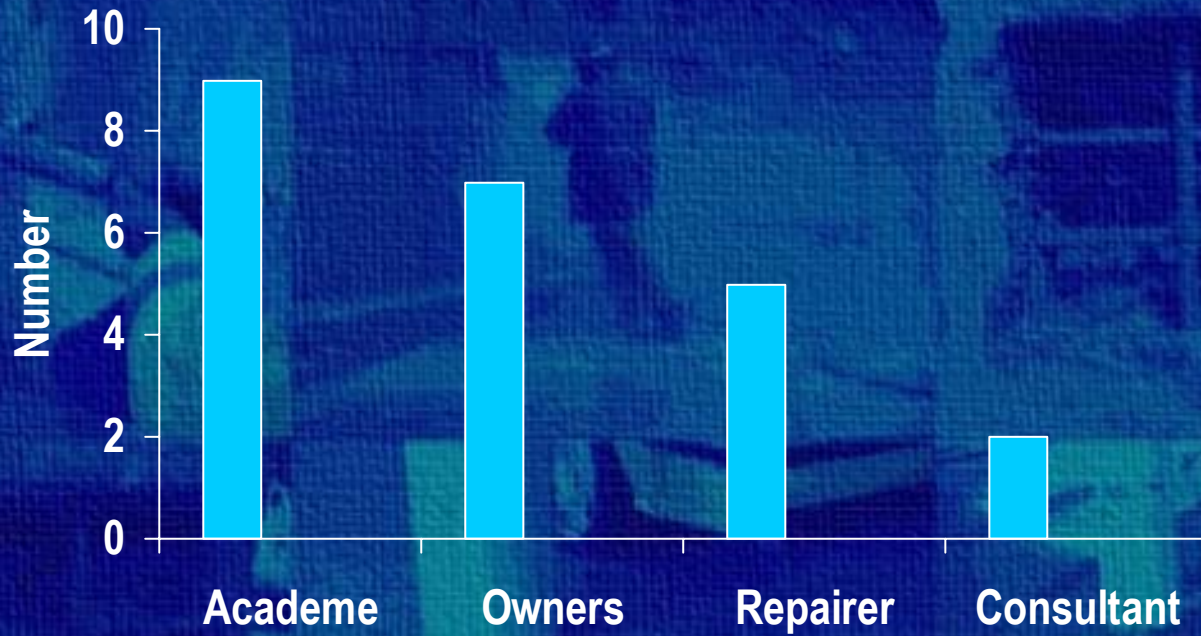
**Graham Tilly, Gifford and Partners**

# CASE HISTORIES

- 215 useable responses
- 23 respondents (43 per cent)

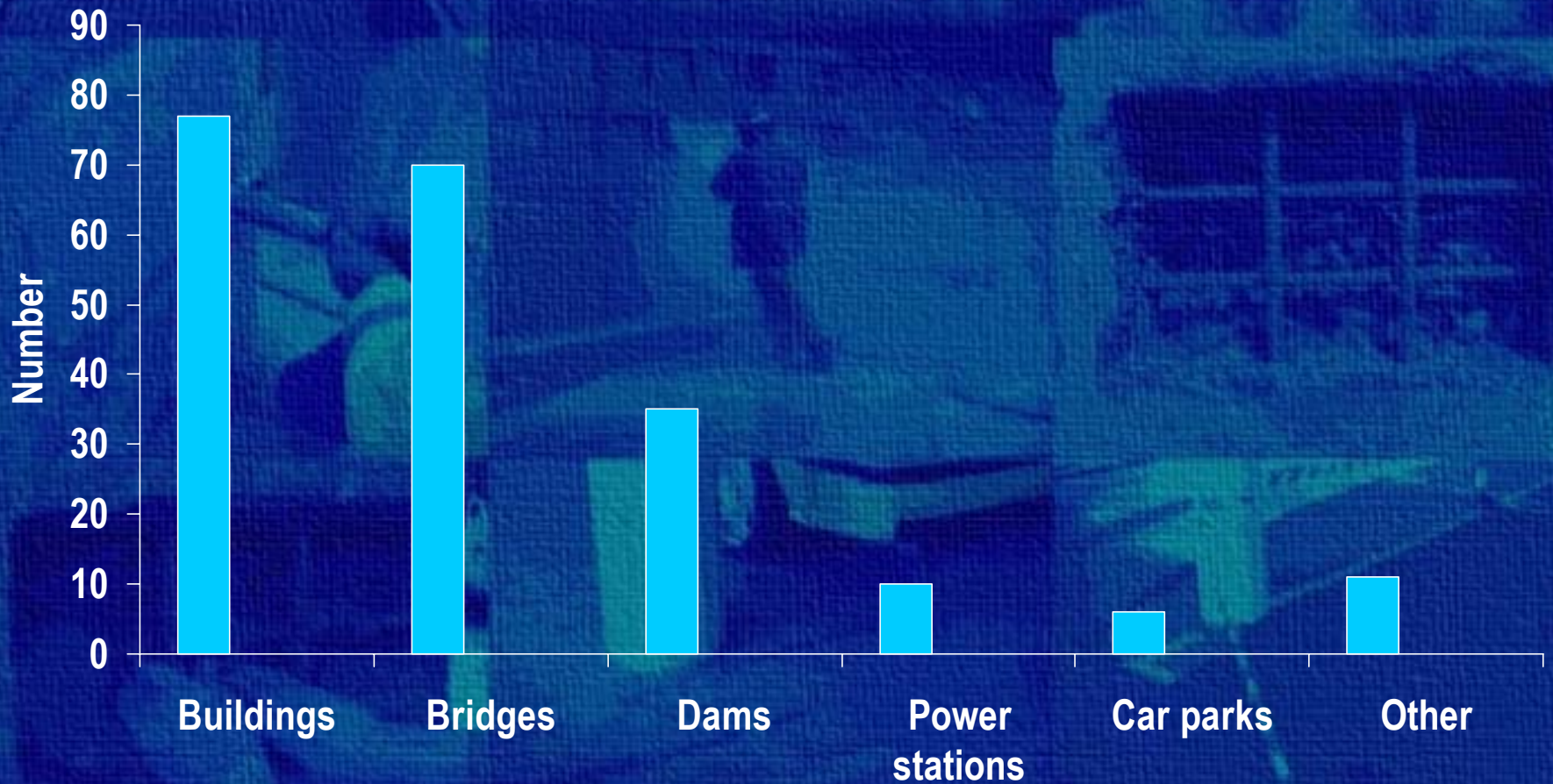
# WP2 PAST PERFORMANCES

## RESPONDENTS



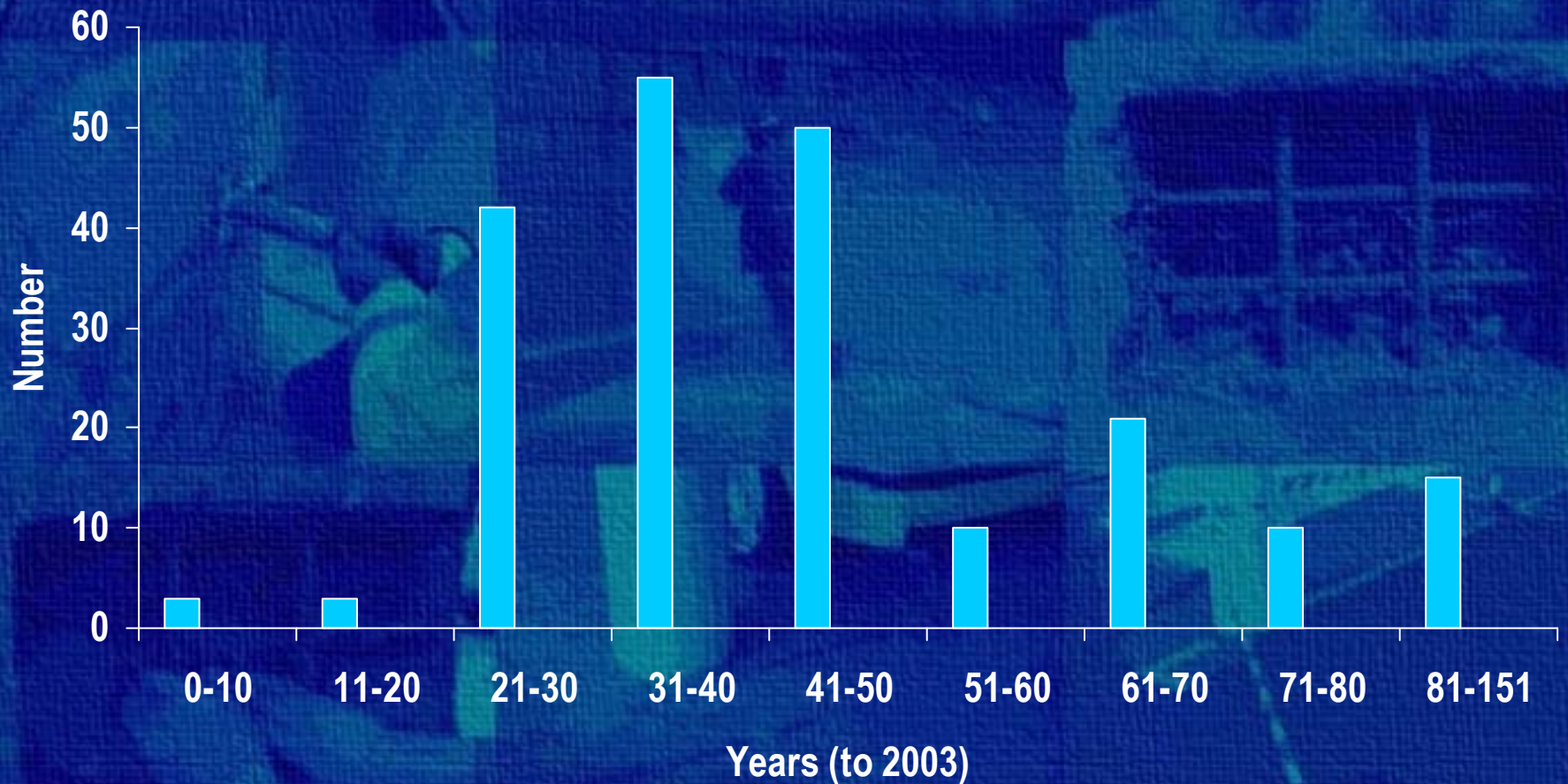
# WP2 PAST PERFORMANCES

## STRUCTURES



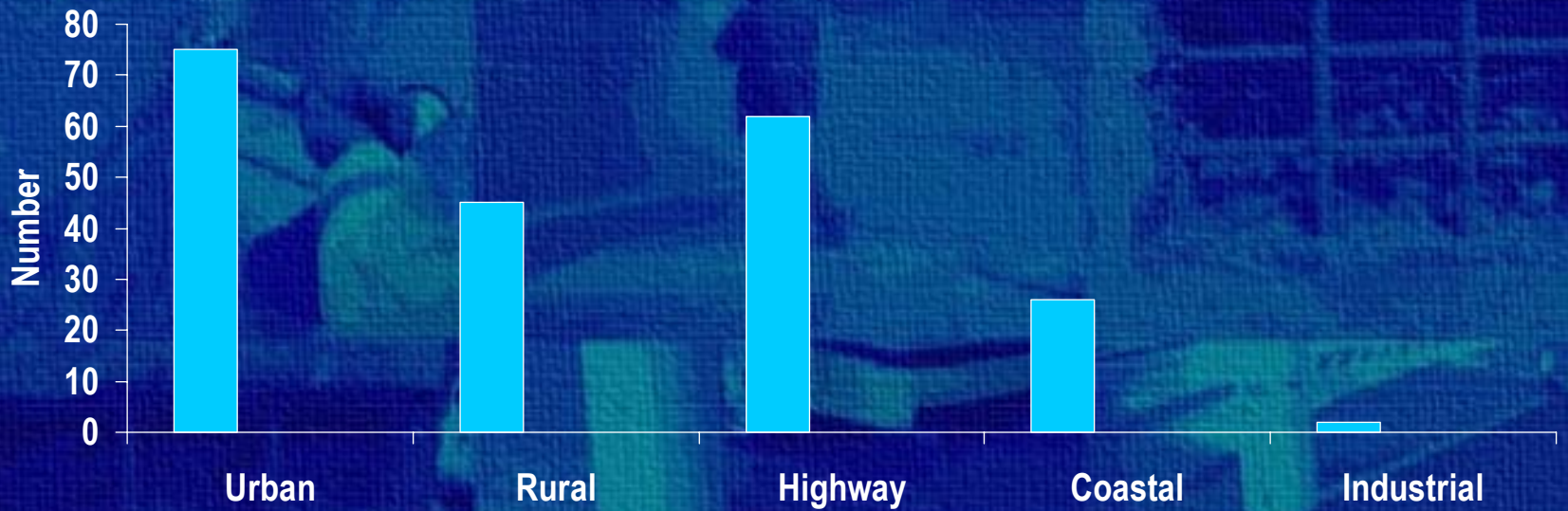
# WP2 PAST PERFORMANCES

## AGES OF STRUCTURES



# WP2 PAST PERFORMANCES

## ENVIRONMENTS

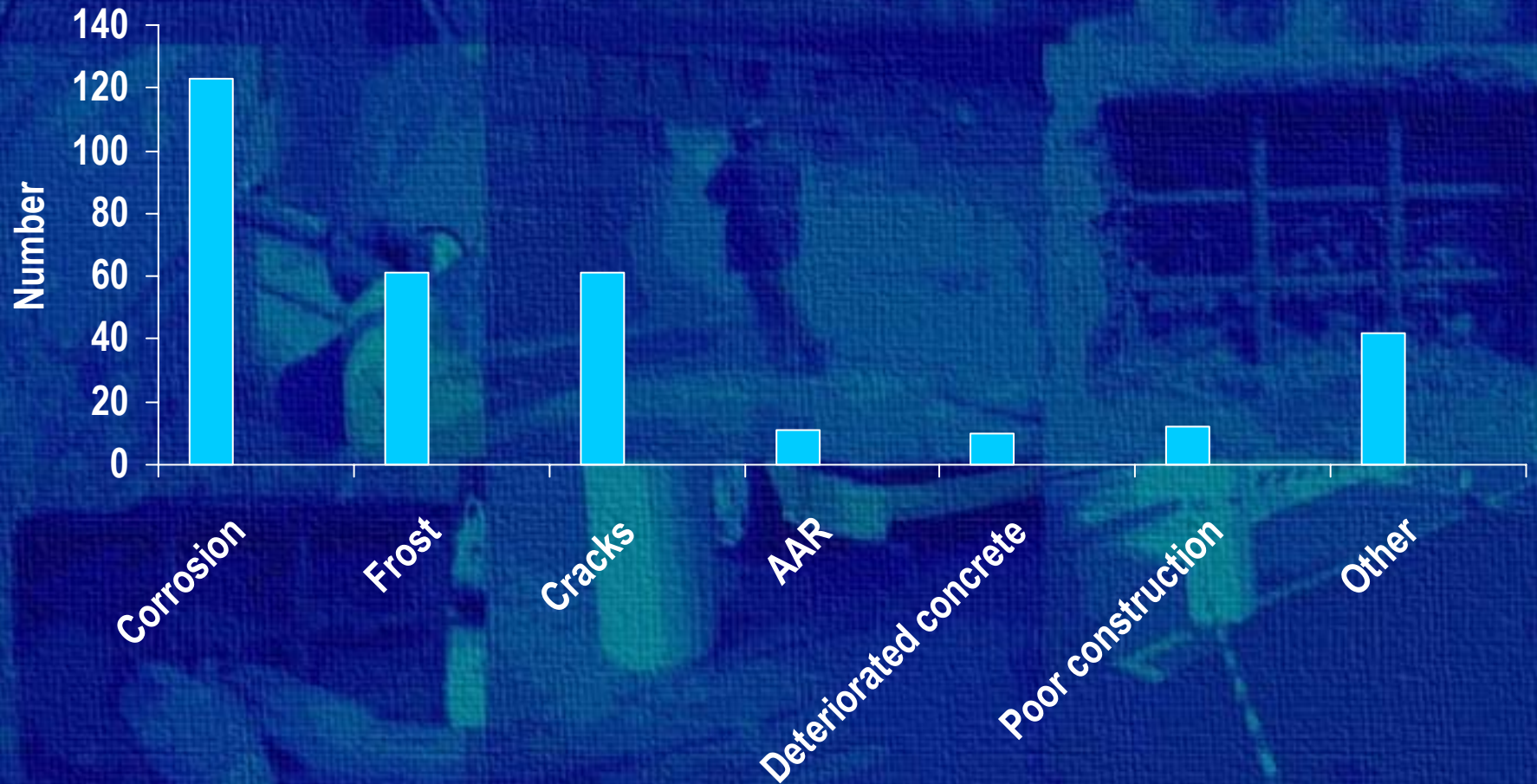


## DETERIORATION AND REPAIR



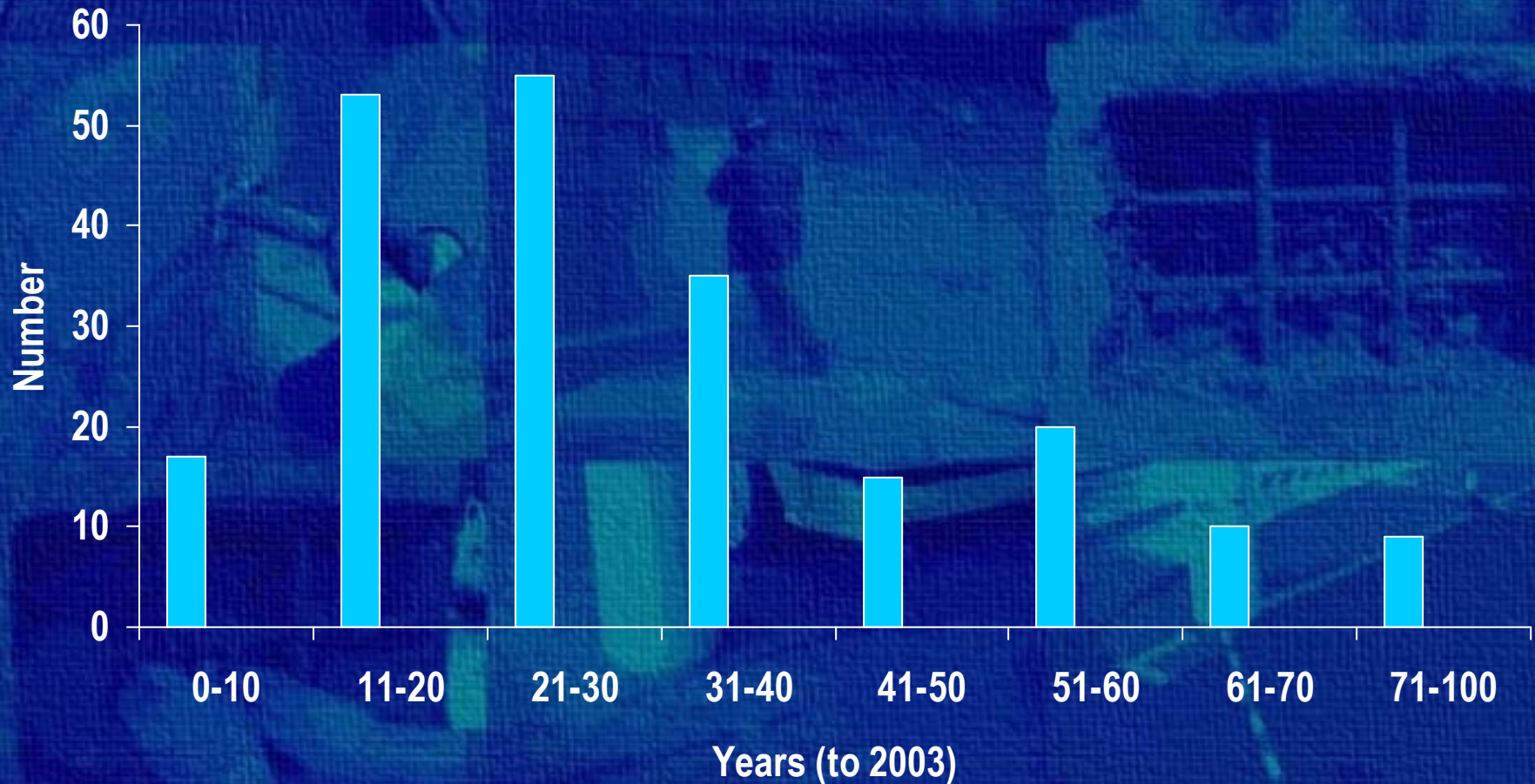
# WP2 PAST PERFORMANCES

## TYPES OF ORIGINAL DETERIORATION



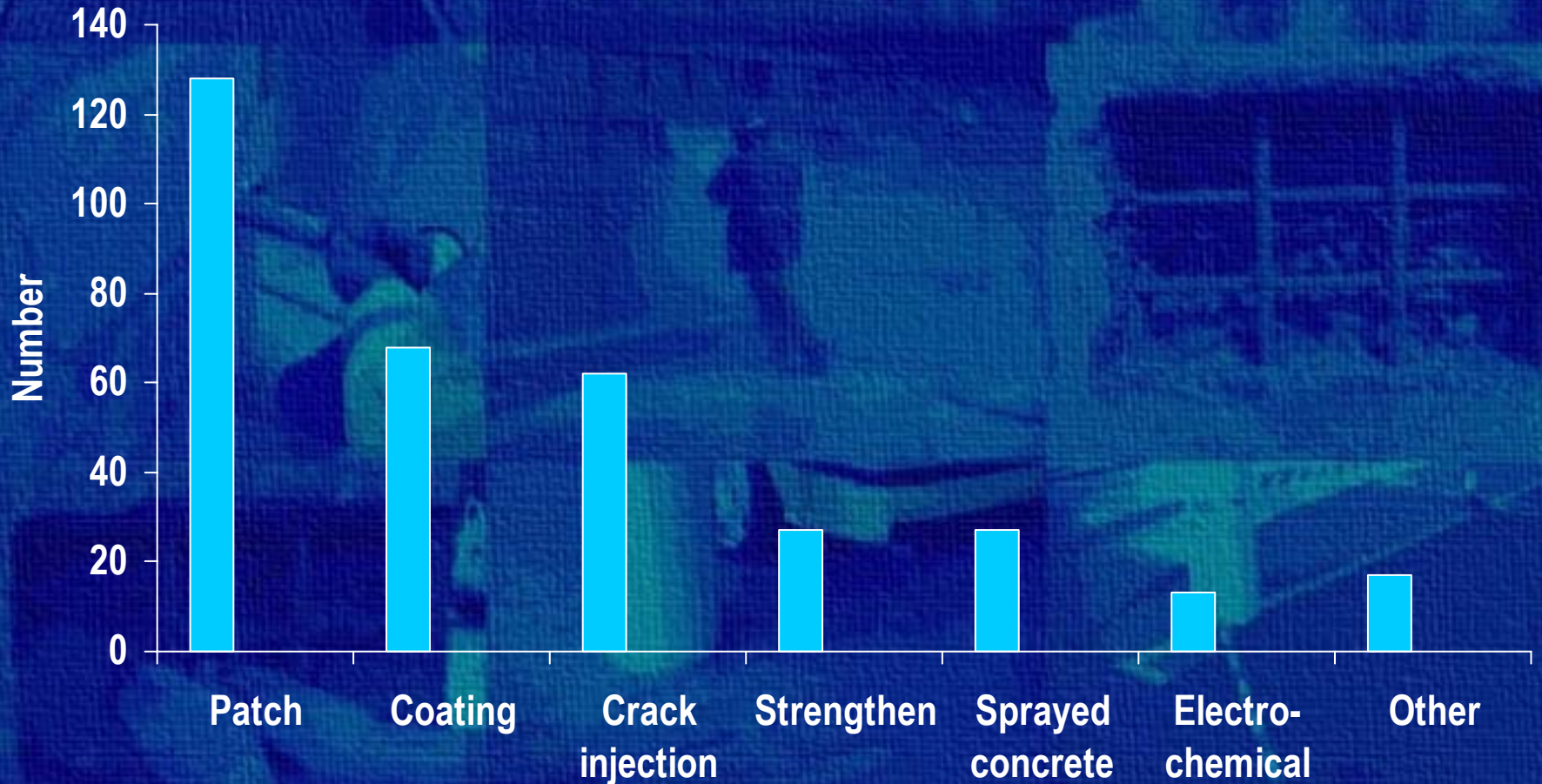
# WP2 PAST PERFORMANCES

## AGES OF STRUCTURES WHEN REPAIRED



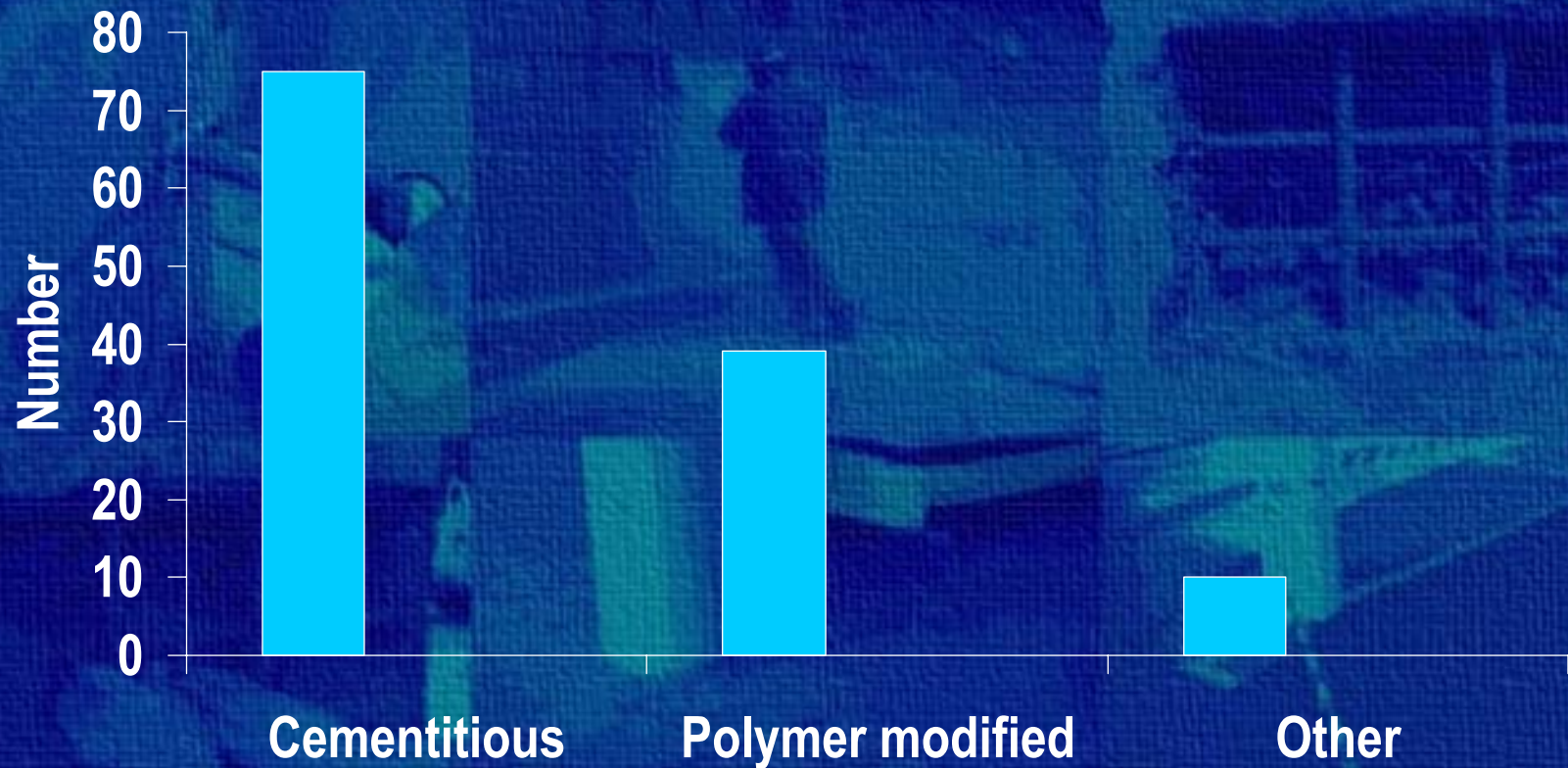
# WP2 PAST PERFORMANCES

## TYPES OF REPAIR



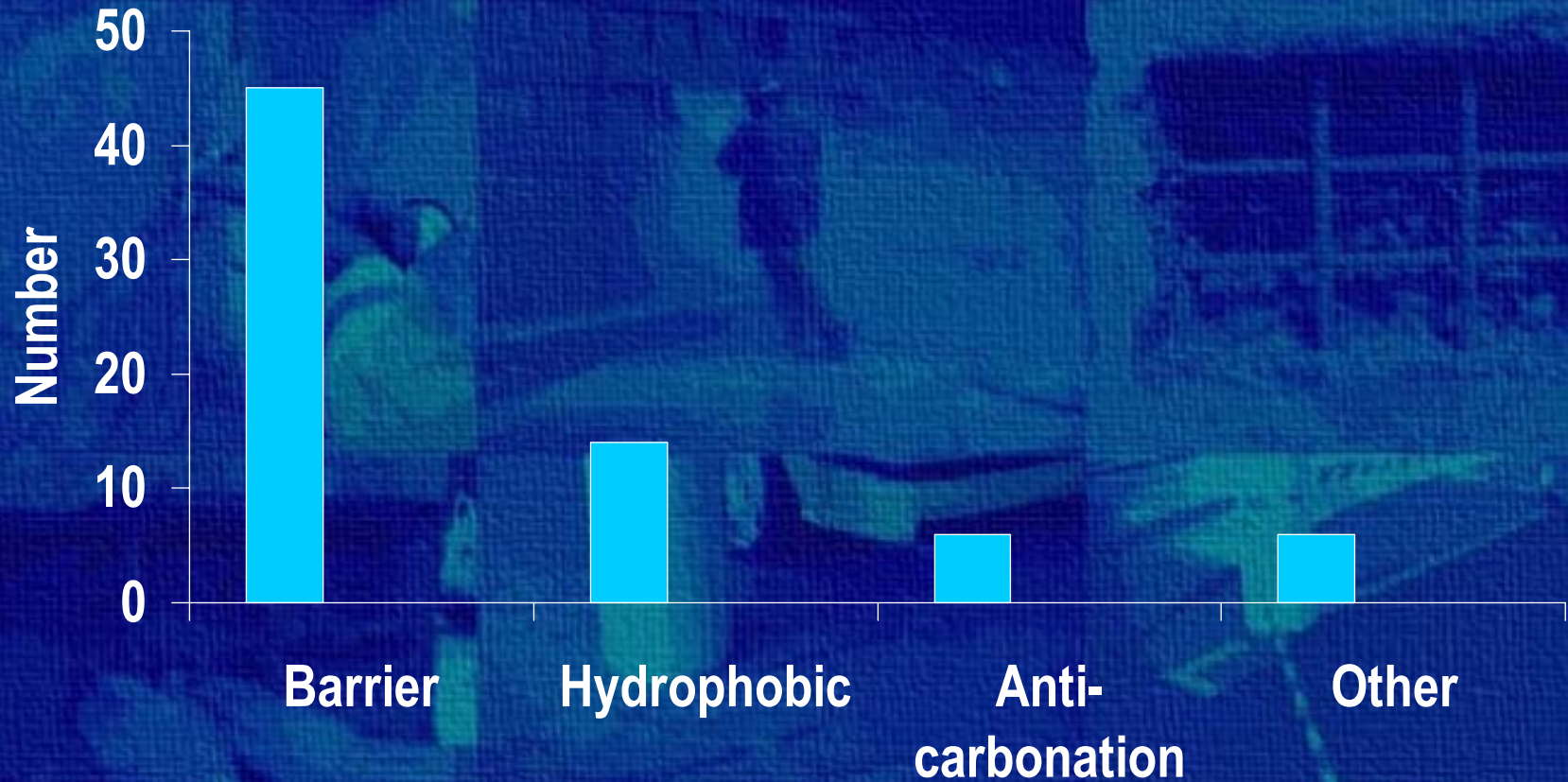
# WP2 PAST PERFORMANCES

## PATCHES



# WP2 PAST PERFORMANCES

## COATINGS



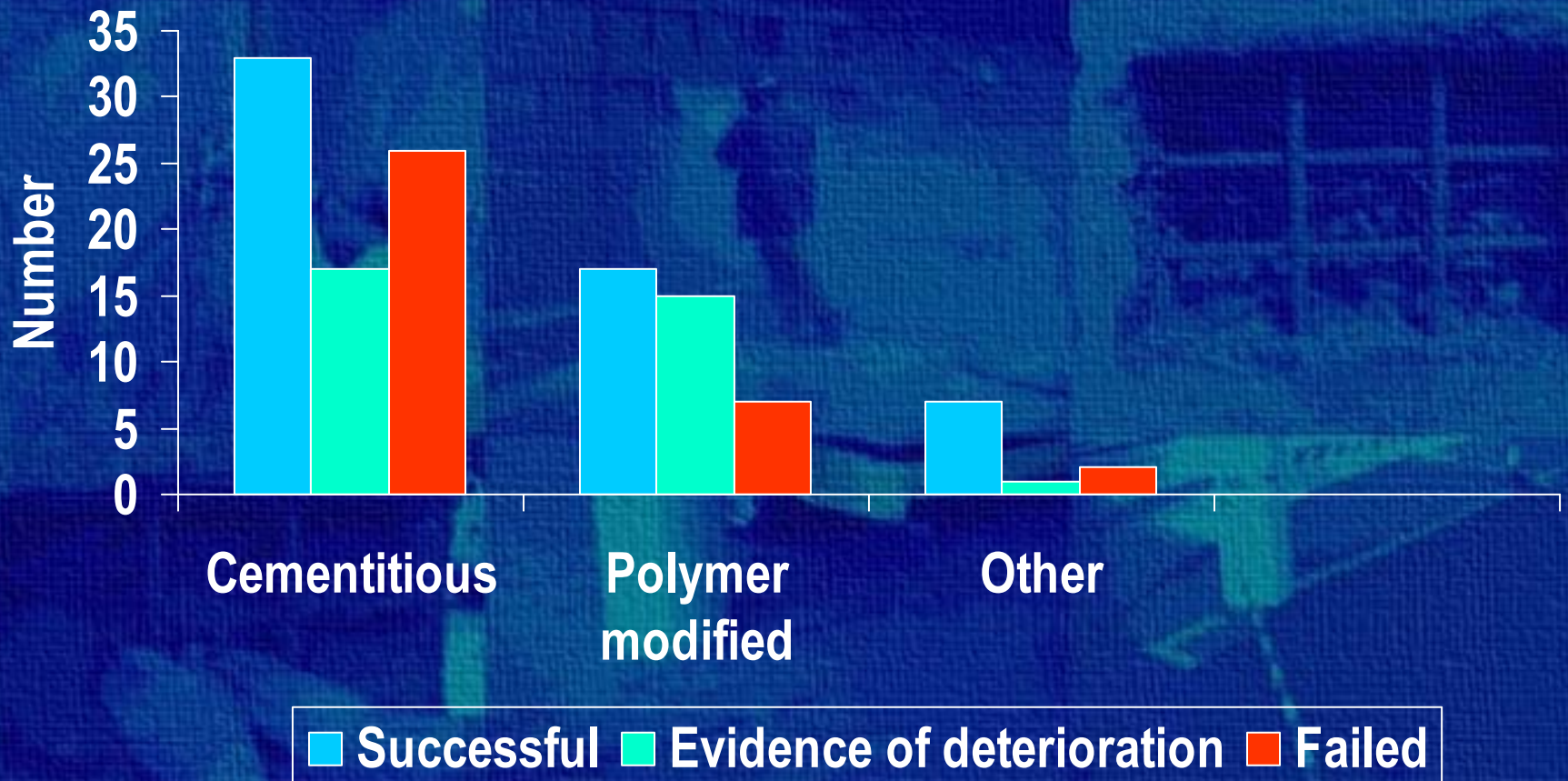
# WP2 PAST PERFORMANCES

## PERFORMANCES OF REPAIRS

- **Successful**
- **Evidence of deterioration**
- **Failed**

# WP2 PAST PERFORMANCES

## PERFORMANCES OF PATCHES



# WP2 PAST PERFORMANCES

## PERFORMANCES OF COATINGS



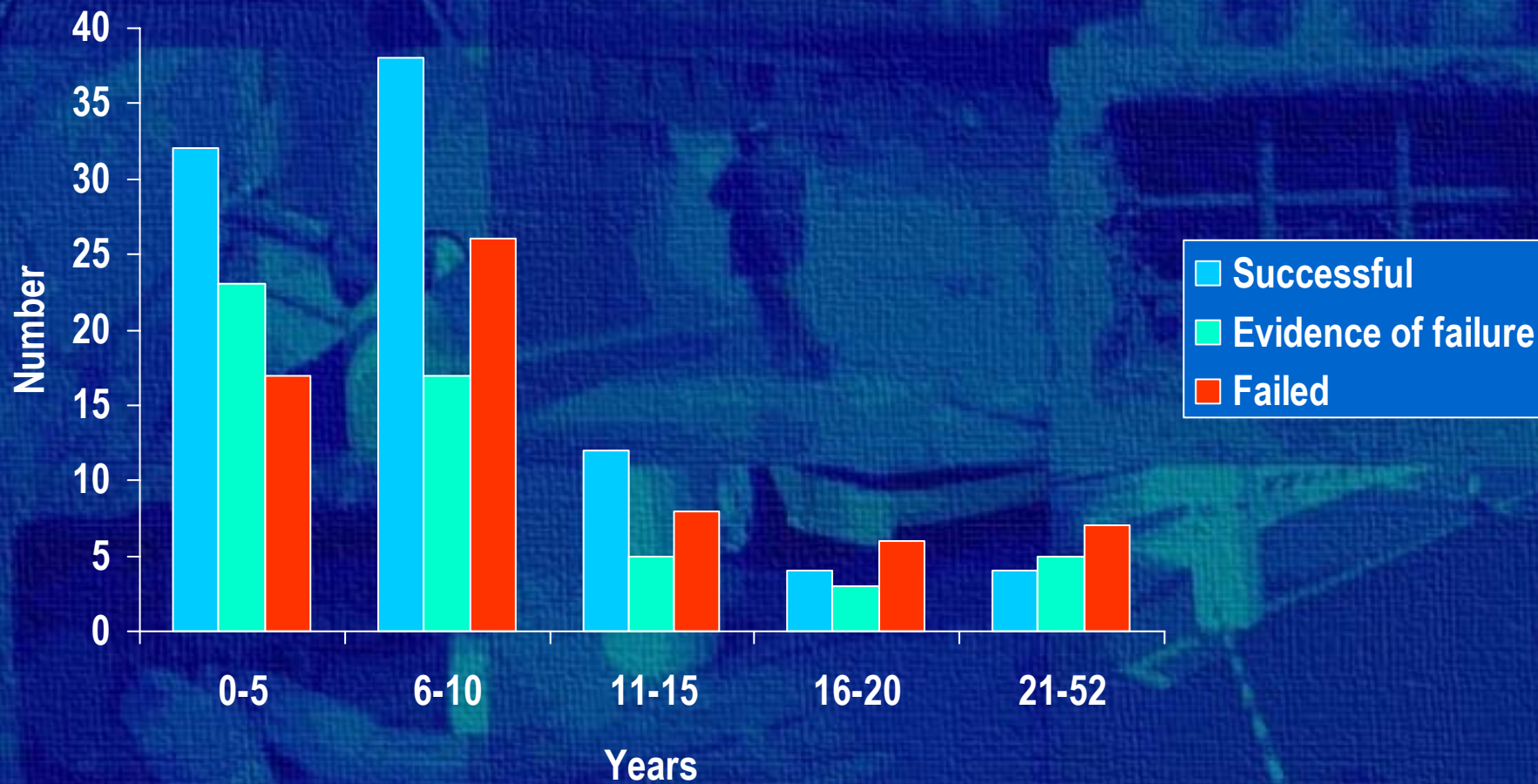
# WP2 PAST PERFORMANCES

## PERFORMANCES OF ALL REPAIRS



# WP2 PAST PERFORMANCES

## PERFORMANCES IN RELATION TO AGES OF REPAIRS



# WP2 PAST PERFORMANCES

## PERFORMANCES OF REPAIRS TO CORROSION



## Failure of Barrier coating



Failure of sprayed coating

D1-021



Continued ASR

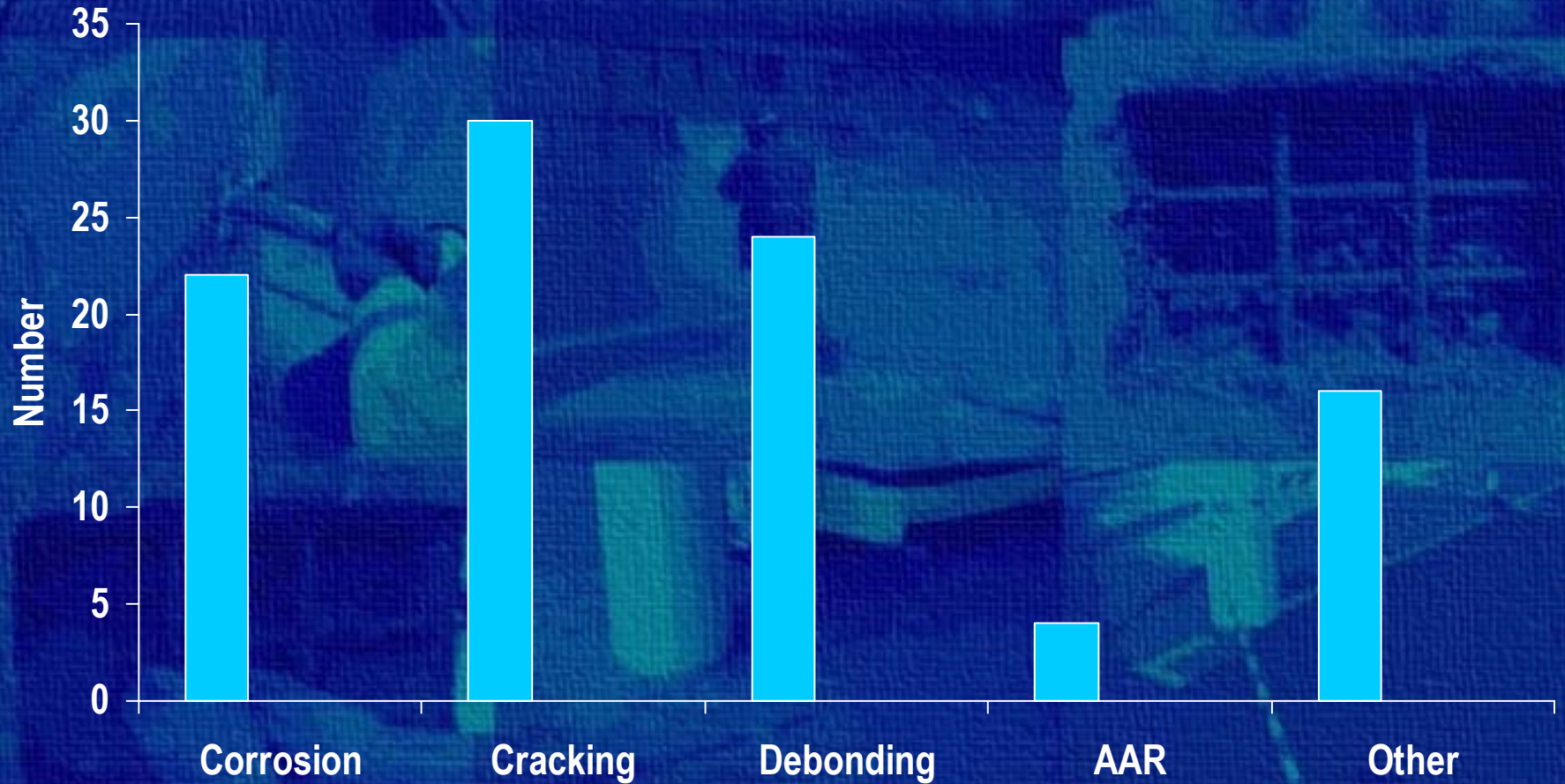


# WP2 PAST PERFORMANCES

## MODES AND CAUSES OF FAILURE

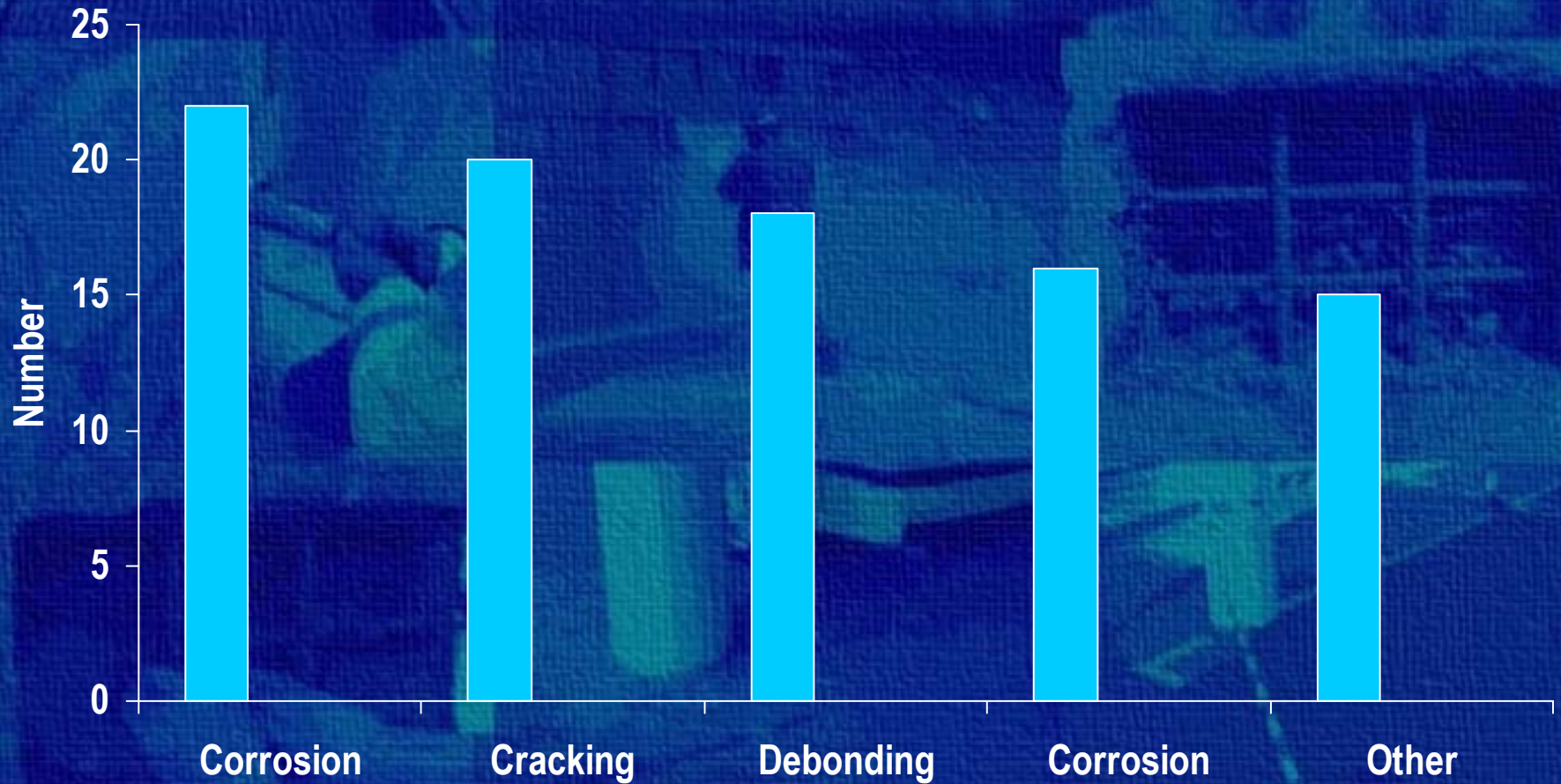
# WP2 PAST PERFORMANCES

## MODES OF FAILURE - All repairs



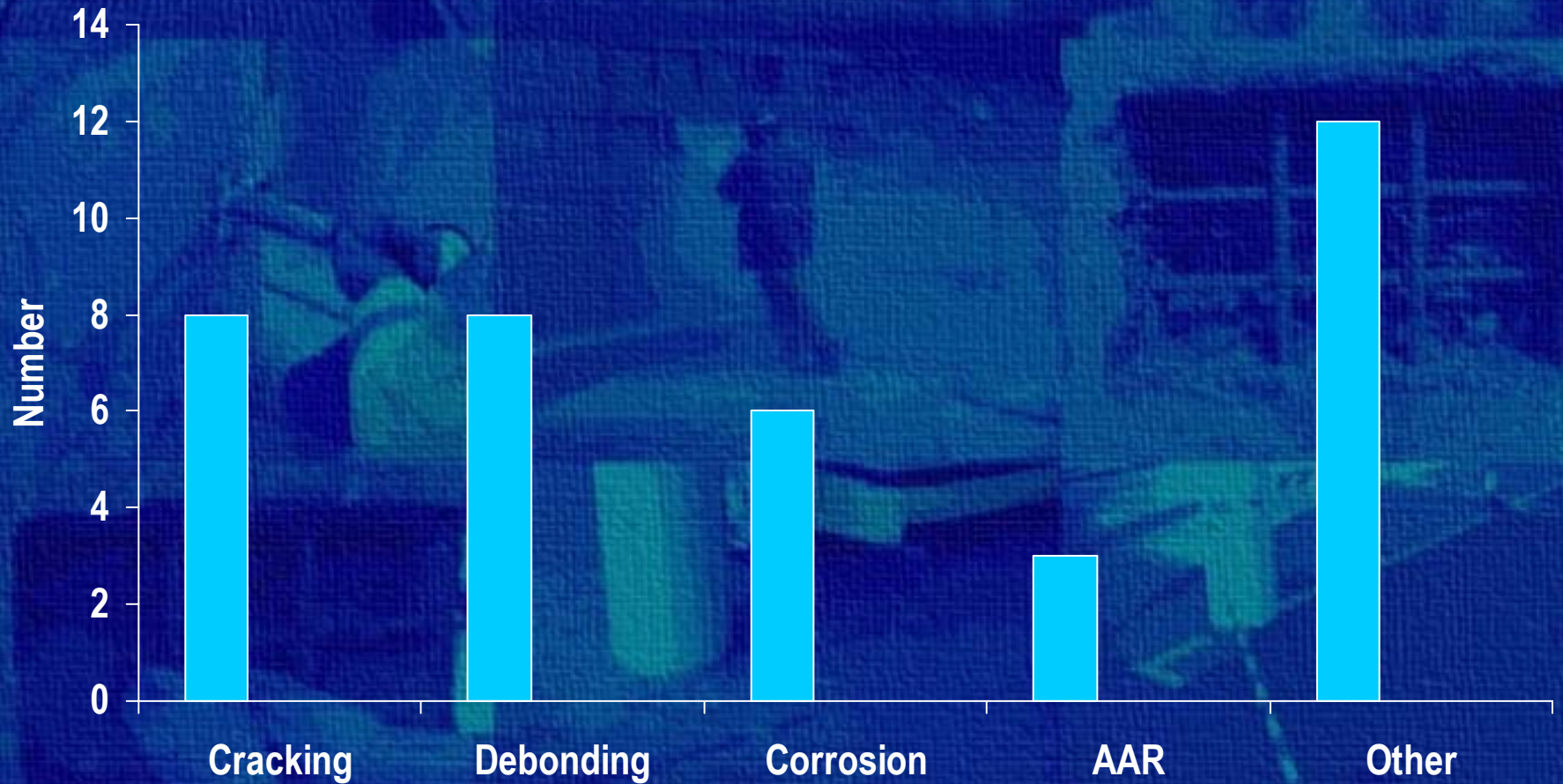
# WP2 PAST PERFORMANCES

## MODES OF FAILURE - Patches



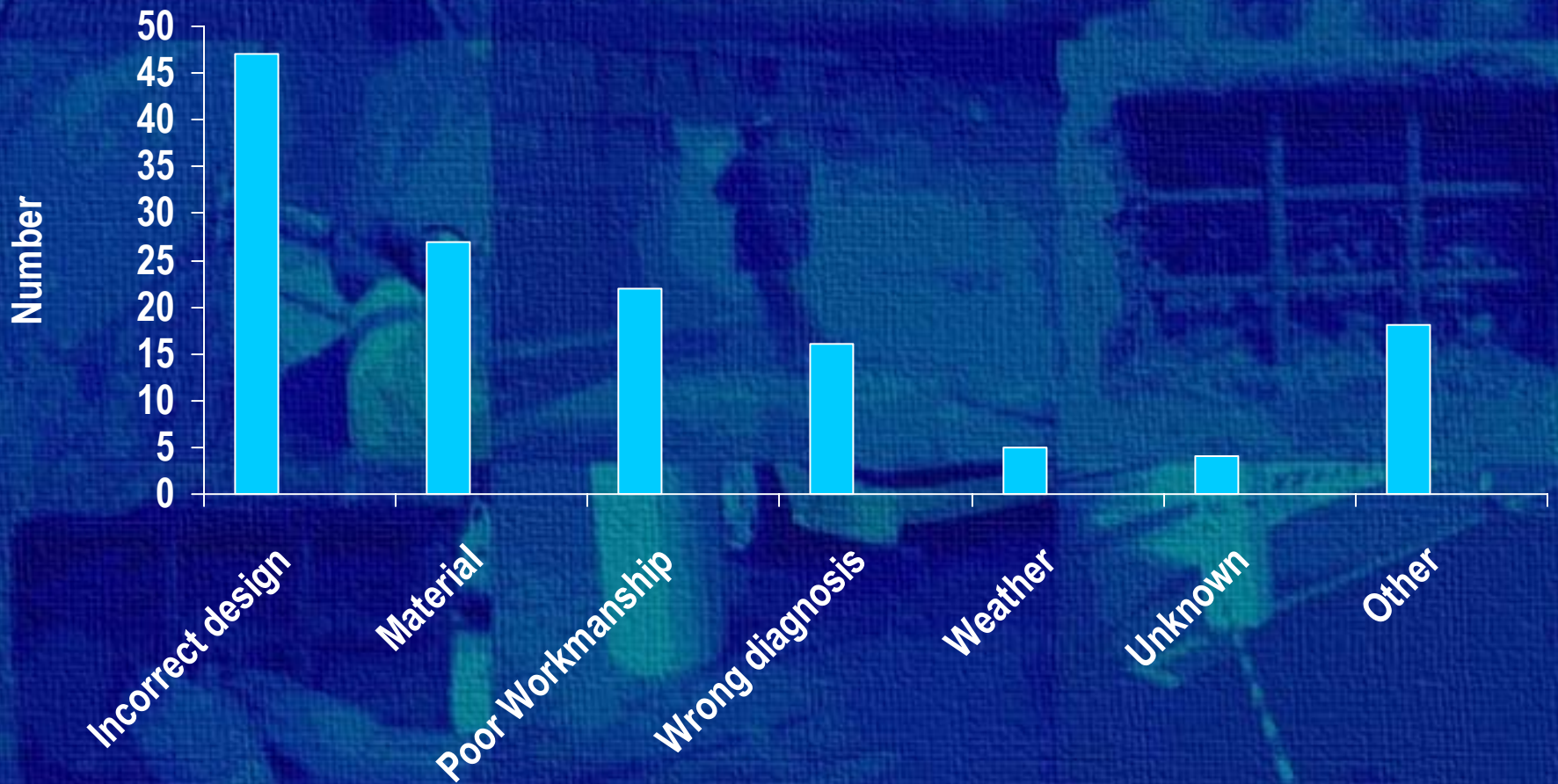
# WP2 PAST PERFORMANCES

## MODES OF FAILURE - Coatings



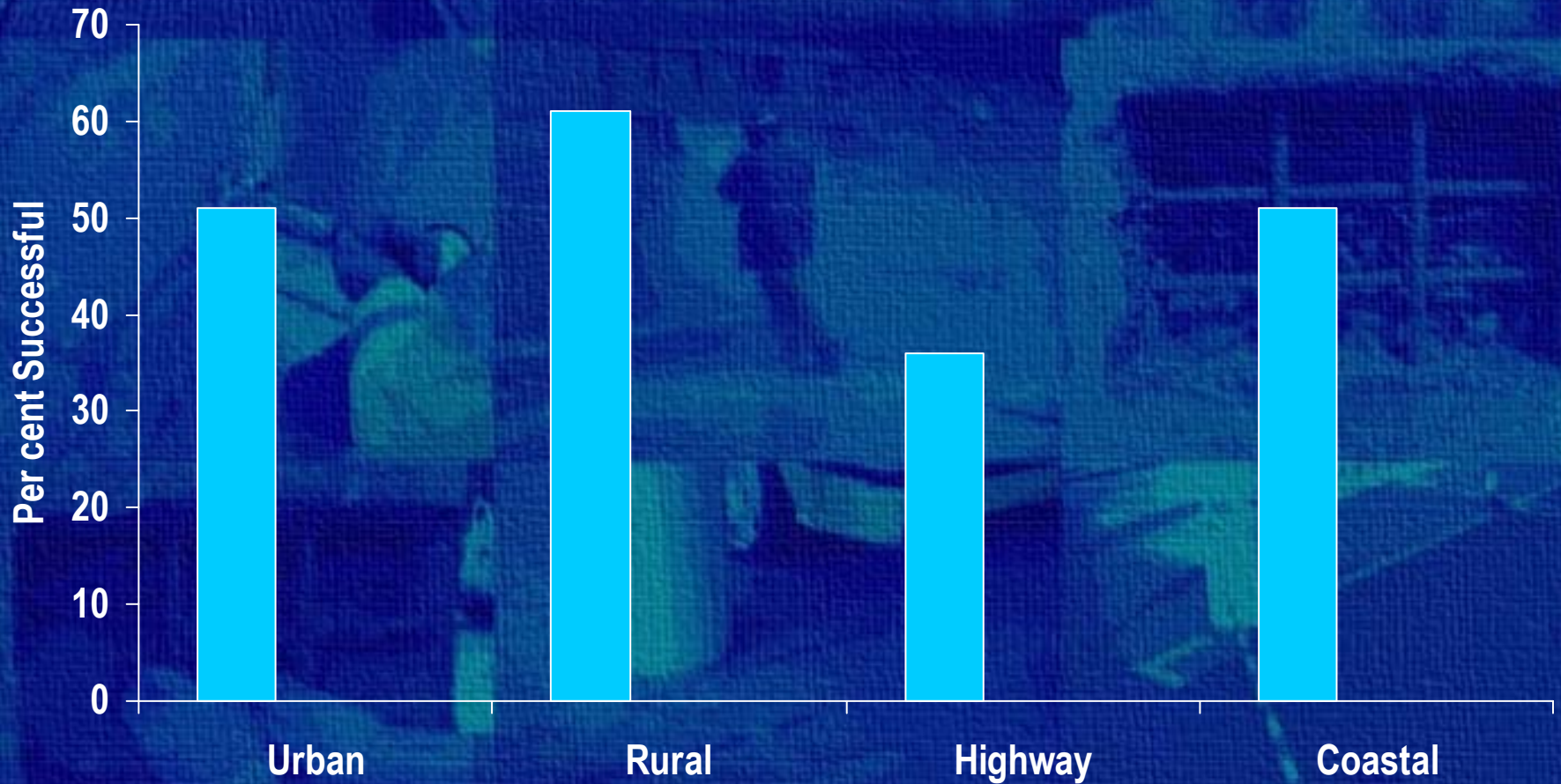
# WP2 PAST PERFORMANCES

## CAUSES OF FAILURE



# WP2 PAST PERFORMANCES

## INFLUENCE OF ENVIRONMENT



# WP2 PAST PERFORMANCES

## SUMMARY

- 215 case histories
- Common problems: corrosion, frost, cracking
- Repairs: patch, coat, crack injection, sprayed
- 50 per cent failed
- 25 per cent survived 10 years
- Failure modes: corrosion, cracking, debonding
- Causes: diagnosis, design, material, workmanship.